

EQUIPMENT SECURITY DEVICE

Background of the Invention

[0001] The present invention relates to a security device for securing equipment such as a lap top computer to a structure.

[0002] A variety of techniques and apparatus have been developed over the years to prevent the unauthorized removal of computers and other office equipment. A number of anti-theft devices have been developed specifically for tower style and desk top computers, as depicted for example in U.S. Patent No. 6,138,483 issued October 31, 2000 to Galant. Such devices are not designed to be used with clam shell style lap top computers which are most often the targets of computer theft.

[0003] Anti-theft devices have also been developed for securing lap top computers, as depicted for example in U.S. Patent No. 5,595,074 issued January 21, 1997 to Munroe. Such rigid devices have generally lacked flexibility and adjusting for lap top computers of different sizes, and lacked the ability to secure lap tops both in the opened and closed positions. One example of a useful lap top security device can be seen in U.S. Patent No. 6,308,928 issued October 30, 2001 to Galant. Although the device disclosed in such patent offers a high degree of security and can also be used to secure lap tops in opened and closed positions, it can be cumbersome to use in some applications.

[0004] Accordingly, it is desirable to provide an equipment security device which can easily be adjusted for use with lap top computers or equipment components of different sizes. It is also desirable to provide a security device that can be conveniently used to secure a lap top computer in both the opened and closed positions.

Summary of the Invention

[0005] According to one aspect of the invention, there is provided a security device for securing an equipment component having opposite corner portions, the security device including a first securing member having a first restraining member for engaging a first corner of the component, and an elongate arm

extending from the first restraining member, and a second securing member having a second restraining member for engaging a second corner of the component that is diagonal to the first corner. A releasable locking device on the second restraining member is provided for engaging the arm to prevent movement of the first and second restraining members away from each other when in an engagement position. The first and second restraining members each include a first pair of spaced apart opposed engagement members for restraining movement of the component in a first plane, and a second pair of spaced apart opposed engagement members for restraining movement of the component in a second plane that is perpendicular to the first plane.

[0006] According to another aspect of the invention, there is provided a security device for securing a substantially rectangular box-shaped component that is defined by spaced-apart cover and base walls with four side-walls extending at least partially between four respective edges of the cover and base walls, pairs of the sidewalls meeting at four corners of the component. The security device includes a first securing member having a first restraining member for engaging a first corner of the component, and an elongate arm extending from the first restraining member, and a second securing member having a second restraining member for engaging a second corner of the component that is diagonal to the first corner. A releasable locking device is provided on the second securing member for engaging the arm to prevent movement of the first and second restraining members away from each other when in an engagement position. The first and second restraining members each include spaced apart cover wall and base wall engagement members, and a pair of spaced apart side-wall engagement members for engaging the cover wall, base wall, and a pair of side-walls, respectively, at the first and second corners, respectively, to restrain movement of the component relative to the security device when in the locked position.

[0007] According to another aspect of the invention, there is provided a security device for securing a lap top computer, the lap top computer having a cover and a base pivotally connected together for movement between an open

position in which the cover extends at an angle from the base, and a closed position in which the cover and base collectively define a rectangular box-like structure, the device including a first securing member having a first restraining member and an elongate locking arm extending therefrom and a second securing member having a second restraining member connected to a locking device for slidably receiving the arm and engaging the arm at a selected one of at least two possible engagement positions to prevent movement of the first and second securing members away from each other. The first and second restraining members each include restraining means that are opposed when the locking arm is received in the locking device, the restraining means having means for engaging the cover and base of an open lap-top computer to restrain movement of the laptop when the arm is received within the locking device at one of the at least two possible engagement positions, and means for engaging diagonally located corners of a closed lap top computer to restrain movement thereof when the arm is received in the locking device at another one of the at least two possible engagement positions.

[0008] According to a further aspect of the invention, there is provided a security device for securing a lap top computer to a support surface of a support member, the lap top computer having a cover and a base pivotally connected together for movement between an open position in which the cover extends at an angle from the base, and a closed position in which the cover and base collectively define a rectangular box-like structure. The device includes first and second securing members each having a restraining member defining an opening for receiving a portion of the lap top cover, the first securing member including an elongate arm extending therefrom, and the second securing member including a locking device for telescopically receiving the elongate arm of the first securing member and for engaging the arm to prevent movement of the first and second securing members away from each other when in an engagement position. At least one of said first and second securing members is adapted to be anchored to the support member. The openings defined by the restraining members of the first and second securing members oppose each other when the

arm is telescopically received in the locking device so that when the lap top computer is positioned on the support member in an open position, the cover can be received between and restrained by the restraining members to secure the lap top to the support member when the lock device is in the engagement position and one of the first and second securing members is anchored to the support member.

[0009] Other aspects of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of specific embodiments of the invention in conjunction with the accompanying figures.

Brief Description of the Drawings

[0010] For a better understanding of the invention, and to show how it may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, like numerals being used to refer to like components throughout, in which:

[0011] Figure 1 is a perspective view of a security device in accordance with a first preferred embodiment of the invention;

[0012] Figure 2 a partial sectional view of a lock assembly of the security device, taken across the lines II-II of Figure 1;

[0013] Figure 3 is a perspective view of the security device of Figure 1 shown in use securing a lap top computer in the opened position to a support member;

[0014] Figure 4 is a perspective view of the security device of Figure 1 shown in use securing a closed lap top computer to a support member;

[0015] Figure 5 is a perspective view of a security device in accordance with a further preferred embodiment of the invention;

[0016] Figure 6 is a perspective view of the security device of Figure 5 shown in use securing a lap top computer in the closed position to a support member;

[0017] Figure 7 is a perspective view of the security device of Figure 5 shown in use securing an open lap top computer to a support member;

[0018] Figure 8 is a perspective view of another security device in accordance with a further preferred embodiment of the invention;

[0019] Figure 9 is a perspective view of a another security device in accordance with a further preferred embodiment of the invention;

[0020] Figure 10 is a perspective view of a security device in accordance with a further preferred embodiment of the invention;

[0021] Figure 11 is a further perspective view of the security device of Figure 10 in use securing a closed lap top computer and docking station; and

[0022] Figure 12 is a perspective view of a security device in accordance with a further preferred embodiment of the invention.

Description of the Preferred Embodiments

[0023] With reference to Figure 1, a security device in accordance with preferred embodiments of the invention is indicated by general reference number 10. The security device 10 includes first and second securing members 12 and 14 which can be telescopically connected together to secure a piece of equipment such as a lap top computer therebetween, as will be explained in greater detail below. The first securing member 12 includes a first hook-like restraining member 16, and the second securing member 14 includes a second hook-like restraining member 18 for restraining movement of a secured lap top computer. An elongate cylindrical rod or arm 20 extends from the first securing member 12 in the same direction that the first hook member 16 opens towards. The second securing member 14 includes a lock device 22 which is configured to telescopically receive the locking arm 20 of the first securing member 12. In the illustrated embodiment, the lock device 22 includes a tubular sleeve 24 which has a lock assembly 26 mounted thereon for engaging ratchet teeth 28 that are provided along the length of an extending portion of the arm 20.

[0024] In the illustrated embodiment, the first hook member 16 includes a base plate 30 to which the locking arm 20 is rigidly attached. First and second base members 32, 34, are rigidly secured to the base plate 30 and run substantially parallel to a portion of the arm 20. First and second sidewall engagement members 36 and 38 extend orthogonally in spaced-apart, parallel fashion from the first and second base members 32 and 34 respectively. A reinforcing member 40, which is spaced-apart from the base plate 30, extends between the

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first sidewall and second sidewall engagement members 36 and 38. A front cover restraining member 42 extends orthogonally from an upper end of the first sidewall engagement member 36, and additionally a back cover restraining member 44 extends orthogonally from the second sidewall engagement member 38. The front cover restraining member 42 and back cover restraining member 44, which are spaced-apart from each other, extend inwardly, that is in substantially the same direction as the arm 20. Thus, the first hook-like restraining member 16 includes two inwardly opening spaced apart hook structures (namely the first sidewall engagement member 36 and front cover restraining member 42 as one hook structure, and the second sidewall engagement member 38 and the back cover restraining member 44 as a second hook structure).

[0025] The second hook restraining member 18 has a similar configuration to the first hook restraining member, and in this regard includes a base plate 46 having first and second spaced-apart base members 48, 50 affixed thereto. First and second sidewall engagement members 52 and 54 extend upwardly in spaced-apart parallel fashion from the elongate base members 48 and 50, respectively. A reinforcing member 60 extends between upper ends of the first and second sidewall engagement members 52 and 54. Spaced-apart, front cover restraining member 56 and a back cover restraining member 58 extend inwardly from the first and second sidewall engagement members 52, 54, respectively. A portion of the tubular sleeve 24 is rigidly connected to the base plate 30 for receiving the locking arm 20.

[0026] As can be appreciated from the illustration of Figure 1, when the locking arm 20 is received within the tubular sleeve 24 of the lock device 22, the first and second hook restraining members, 16, 18 have opposing openings. In use, a lap top computer can be engaged between these opposed openings.

[0027] In one preferred embodiment, a through-hole 62 is provided through the base plate 46 in order to permit the security device 10 to be anchored to a support member 64. By way of example, a bolt 66 and nut 68 combination could be used in combination with the through hole 62 to secure the second securing

member 14 to an upper surface 70 of the support member 64. Preferably, the bolt 68 would be received in a recessed hole on the underside of the support member 64 in order to prevent its unauthorized removal, or alternatively the nut 68 could be located in an area of the underside support member 64 which is protected by a locked drawer or the like.

[0028] The locking assembly 26 will now be described with reference to Figure 2. In a preferred embodiment of the invention, the security device uses a locking assembly 26 having a similar configuration and construction as the locking assembly described in U.S. Patent No. 6,308,928 issued October 30, 2001, to the inventor of the present invention. In this regard, the locking assembly 26 has a hardened steel housing 70 having a blind hole 72 in which is situated a spring loaded pawl 74. The spring loaded pawl 74 is normally biased into a locked position (shown in Figure 2) under the influence of a spring 76. In this position, the spring 76 biases the pawl 74 part way into a passage way 78 of the lock assembly 26 for receiving the arm 20 therethrough.

[0029] The pawl 74 presents an inclined surface 80 for meeting a frustial conical surface 82 of the ratchet teeth 28 that are provided along the arm 20. This configuration allows the arm 20 be advanced within the passage way 78 relative to the locking device 26 in the direction of arrow 84 shown in Figure 2. When moved in the direction of arrow 84, the pawl 74 is pushed into the blind hole 72 by each ratchet tooth 28 passing the pawl 74. As each ratchet tooth 28 passes the pawl 74, the spring 76 urges the pawl 74 back into an annular space 86 between adjacent ratchet teeth 28. When the pawl is positioned in an annual space 86, movement of the arm 20 in a direction opposite to the direction shown by arrow 84 is blocked by the engagement of transversely-extending planar surface 88 of the pawl 74 with a portion of a planar angular surface 90 of a subject ratchet tooth 28. Thus, the spring-loaded pawl 74 permits the arm 20 to be telescoped into the locking device 22 while preventing the arm 20 from being separated from the locking device 22 when it is in its locked position. In one embodiment, the lock assembly 26 is actuated by a removable key 92. In a manner known in the art, rotation of the key 92 will rotate a torque blade and displace the pawl 74 into the

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[0030] An overview of the security device 10 having been provided, an explanation of the operation of the device to secure an open lap top computer will now be explained with reference to Figures 1-3. With reference to Figure 3, a lap top computer 100 is shown secured in an opened position to the support member 64. The lap top computer 100 includes a cover 102 and a base 104 pivotally connected together for movement between an open position in which the cover extends at an angle from the base, and a closed position in which the cover and base collectively define a rectangular box-like structure. In the example illustrated in Figure 3, the second securing member 14 has been anchored to an upper surface 70 of the support member 64 by means of a bolt 66. As can be appreciated from Figure 3, the through hole 62 (see Figure 1) passes through the base plate 46 of the securing member 14 in a location that is located underneath base 104 of the lap top computer when the computer is secured by the securing device 10, thus preventing access to the securing bolt 66.

[0031] As will be understood from Figures 1 and 3, when securing the lap top 100, the locking arm 20 extends underneath the base 104 of the lap top with its extending end is received within the sleeve 24 of lock device 22. The first securing member 12 is telescoped towards the second securing member 14 until the lap top is restrained between the first hook restraining member 16 and second hook restraining member 18 as shown in Figure 3. In the engagement position as shown in Figure 3, upward movement of the lap top computer is prevented by front cover restraining members 42 and 56 which engage an upper surface of the base 104 if the lap top 104 is moved in an upward direction. Front cover restraining members 42 and 56 also restrain forward movement of the lap top computer 100 by engaging a front portion of the cover 102 when the lap top is moved in a forward manner. Backward movement of the lap top computer is restrained by back cover restraining members 44 and 58 which engage back portions of the cover 102 when the lap top computer 100 is moved in a rearward

direction. Sideways movement of the lap top computer is restrained by first sidewall engagement members 36 and 52 and, in the embodiment of Figure 3, also by reinforcing members 40 and 60.

[0032] Thus, in the engagement position, the first and second opposed hook restraining members 16 and 18 prevent unauthorized removal of the lap top computer. For each of the restraining members, the respective front cover restraining members 42 and 56 and elongate base members 32 and 48 are preferably spaced far enough apart to accommodate a wide range of different lap top thicknesses (and also to accommodate closed lap tops as explained in greater detail below), while at the same time not being spaced so far apart so as to allow the lap top computer to be rotated out of the security device 10. Similarly, the front cover restraining members 42, 56 are preferably spaced sufficiently far from their corresponding back cover restraining members 44, 58 to accommodate a range of lap top covers of varying thickness, and also to permit the lap top screen to be angled according to the preference of the user, while at the same time not being spaced-apart so far as to permit the lap top computer 100 to be rotated out of the security device. Rotation of the key 92 to unlock the lock assembly 26 will release the pawl 74 from the ratchet teeth 28 to permit separation of the first and second securing members in order to release the lap top computer 100.

[0033] With reference to Figure 4, the heretofore described embodiment offers a great degree of a flexibility in that the adjustability permitted by telescopic locking arm 20, and the configuration of the first and second hook members 16 and 18, permit the security device 10 to also be used to secure a closed lap top computer 100 to the support surface of the support member 64. In Figure 4, the first securing member 14 has been anchored to the support member 64. In the engagement position, a pair of diagonally located corners of the lap top computer 100 are secured between the opposed first and second hook members 16 and 18. With respect to first hook restraining member 16, opposed first and second sidewall engagement members 36, 38 restrain movement of the lap top computer 100 in a horizontal plane parallel to the upper surface of support member 64 by

[0034] It will be appreciated that when the security device 10 is in its engagement position securing a closed lap top computer, even if a potential thief manages to pry the security device 10 from the support member 64, the lap top computer 100 will still effectively be locked in the closed position. In some environments, the security device may be used to maintain a lap top computer in a closed position without anchoring the device to a support member 64 by means of bolt 66.

[0036] Many variations and different embodiments of the present invention are possible. For example, in some applications the reinforcing members 40 and 60 may not be required. A non-exclusive list of examples of other possible modifications is as follows. Although bolt 66 passing through a through hole 62 has been described as one means for securing the security device 10 to a

[0037] Although a key actuated lock assembly 26 has been shown in the Figures, different types of lock assemblies could be used such as a combination actuated lock in place of a key actuated lock. Furthermore, a number of different types of pawl and ratchet configurations could be used, and in some embodiments a less sophisticated locking methods could be used, for example through holes could be provided along the length of the arm 20 for receiving a padlock passed through corresponding locking holes provided in the sleeve 24. Although the locking arm 20 and sleeve 24 have been shown as cylindrical, different telescoping configurations could be used.

[0038] With reference to Figure 5, a security device in accordance with further preferred embodiments of the invention is indicated by general reference number 200. The security device 200, although similar to the security device 10, differs from the security device 10 in respects that will be apparent from the drawings of the respective devices and the following description. As with device 10, the security device 200 includes first and second securing members 12 and 14 which can be telescopically connected together to secure a piece of equipment such as a lap top computer therebetween, the first securing member 12 including a first hook-like restraining member 16, and the second securing member 14 including a

[0042] The second securing member 14 includes a lock device 22 which is

configured to telescopically receive the locking arm 20 of the first securing member 12. As with security device 10, the lock device 22 includes a tubular sleeve 24 which has a lock assembly 26 mounted thereon for engaging ratchet teeth 28 that are provided along the length of an extending portion of the arm 20. The tubular sleeve 24 of the security device 200 is spaced apart from the base plate 46 and is rigidly secured to the arm 230 of the restraining member 18.

[0043] When the locking arm 20 of the security device 200 is received within the tubular sleeve 24 of the lock device 22, the first and second hook restraining members, 16, 18 have opposing openings. In use, a lap top computer can be received between these opposed openings. Similar to security device 10, the security device 200 can be anchored to a support member 64 by means of bolt 66 passing through hole 62 that is provided through the base plate 46.

[0044] In addition to or in place of a bolt passing through hole 62, a cable 242 could be used to secure the security device 200 (or security device 10 or any of the other embodiments of the security device that are described further below) to a structure. In the embodiment illustrated in Figure 5, the cable 242 is secured at one end to the security device 200 by means of a loop 244 through which the arm 20 or sleeve 24 is threaded through. The loop 244 is small enough so that it can not be slipped over the opposed restraining members 16 or 18. An eye bolt and nut combination 246 can be used to secure the other end of the cable 242 to a structure to prevent unauthorized removal of the security device and the piece of equipment that is engaged by the security device. A second loop 248 on the cable 242 can also be threaded through the arm 20 or sleeve 24 so that security device 200 can be secured in place by passing the cable 242 through a hole or opening in a structure and inserting the arm 20 or sleeve 24 through both loops 244, 248. Such a cable configuration could conveniently be used to secure a lap top computer (or other rectangular-type equipment) to a car part within the car cabin or a car trunk, for example.

[0045] Figure 6 shows the security device 200 securing closed laptop computer 100 by engaging the diagonally opposite corner portions 250 and 252 of the laptop computer 100. The first restraining member 16 includes portions that

[0046] Figure 7 shows the security device 200 securing laptop computer 100 in an open position. Opposite side edge portions of the open cover 102 are received and restrained within the opposed openings 220 and 240 that are defined by U-shaped plates 212 and 232, respectively, and opposite side edge portions of the base 104 are received within the opposed openings defined by baseplate 46, sidewall engagement member 234 and arm 228 of the restraining member 18 and baseplate 30, sidewall engagement member 204 and arm 208 of the restraining member 16. As can be appreciated from Figure 7, the locking arm 20 and sleeve 24 are located behind the open cover 102, rather than under the computer as in the embodiment of Figure 3, and thus the security device 200 does not require that the computer base 204 sit at an angle relative to the support surface 70. Furthermore, as the locking arm 20 does not pass under the laptop, the lock assembly 26 can be positioned between the first and second restraining members 16 and 18, thus making the security device 200 have an overall relative length that is shorter than that of device 10 in which the lock assembly is located outside of the second restraining member 18.

[0047] With reference to Figure 8, another security device in accordance with further preferred embodiments of the invention is indicated by general reference

[0048] In the illustrated embodiment, the first hook member 16 of device 260 is made up of a base plate 262, from which locking arm 20 extends. An optional shim plate 264 is positioned on the base plate 262. An inwardly opening (ie. towards a center of the security device 260) U-shaped wall 266 extends upward from the baseplate 262 having opposed wall portions 268, 270. A U-shaped plate 272 defining an inward facing opening 274 is located at an upper end of U-shaped wall 266 in spaced apart and opposed relation to the shim plate 264.

[0050] In a manner similar to security devices 10 and 200, the device 260 can secure a lap-top computer in both the open and shut positions. In the shut position, diagonally opposite corner portions of the laptop computer are received within and restrained by the restraining members 16 and 18. In particular, the laptop computer sidewalls meeting at one corner are engaged by the opposed sidewall portions 268 and 270 of restraining member 16, with the upper cover and bottom

[0051] In the laptop open position, the device 260 receives opposite side edges of the laptop cover within openings 274 and 294, and opposite side edges of the laptop base within the space between the shim plate 264 and U-shaped plate 272 at one edge and the shim plate 284 and U-shaped plate 292 at the opposite edge.

[0053] In some embodiments, the security device may be configured to permit only closed equipment components to be secured, and may be configured to secure equipment components that have opposite corner portions, but which are not perfectly square or rectangular in shape. In this regard, Figures 10 and 11 show an example of a further security device, indicated generally by reference 330, in accordance with preferred embodiments of the present invention. The security device 330 operates in a similar to the devices described above, having first and second securing members 12 and 14 that can be telescopically locked together, with opposed restraining members 332 and 334 for engaging opposite corners on a component. As will be apparent from the drawings, the security device 330, however, is not configured for use with an open laptop computer, but is configured to be used to secure a closed laptop computer 100 that is attached to a docking station 336.

[0054] As shown in Figure 12, the security device 330 may be provided with adjustable shim plates for adjusting for computer components of different thicknesses or heights. In this respect, each of the restraining members 332, 334 has a base shim plate 336 to which can be added one or more additional shim

[0055] Figure 12 shows yet a further security device, indicated generally by reference 350, for securing a closed docked lap-top in accordance with the present invention. The device 350 is similar to device 330, except that the locking arm and corresponding sleeve are located to pass over the top of the computer and docking station, rather than under it, which permits the device 350 to have a shorter overall profile as locking assembly 26 can be located between the opposed restraining members.

[0056] As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. The foregoing description is of the preferred embodiments and is by way of example, and is not to limit the scope of the invention as set forth in the following claims.